

1 **6 Built Environment**

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3 **6.4 Climate Change and Sea-Level Rise**

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5 The sea-level rise driven by global climate change is the single direst threat to the continued
6 existence of Dewey Beach many sea level rise models are now predicting a 3-foot-plus increase
7 in effective sea level rise by 2100; a 3 foot increase in local sea level would be catastrophic for
8 Dewey Beach without effective adaptation measures put in place long such a 3 foot rise was
9 realized.

10
11 *Vision Statement – Climate Change. The Town’s strategic response to climate change*
12 *preserves its culture and commerce over the next 100 years.*

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14 **6.4.1 Current Situation**

15 Between 2013 and 2015 the Federal Emergency management Agency (FEMA) proposed and
16 adopted a new set of Flood Insurance Rate Maps (FIRMs) nationwide. Dewey Beach participates
17 in the FEMA Community Rating System (CRS) program, which enables property owners in
18 Dewey Beach to purchase flood insurance through the National Flood Insurance Program at a
19 marked discount from what one would have to pay sourcing such insurance through a private
20 third party. As part of the responsibilities to participate in the CRS, Dewey Beach was required
21 to adopt new Flood Damage Reduction ordinance, which it did by amending Chapter 101 Flood
22 Damage Reduction of the Town Municipal Code in February 2015 so as to conform to the
23 updated FEMA requirements.

24
25 The new FIRM for Dewey Beach became effective on March __, 2015, and is reproduced as
26 Map _____. About half of the Town is in a Special Flood Hazard area. The contours represent 1%
27 annual probability flood levels. The two major differences between the now effective and prior
28 FIRMs are: inclusion of a VE special flood hazard area along Rehoboth Bay, and more
29 convoluted boundaries between AE and AO special flood hazard areas. The latter largely due to
30 higher accuracy topography used in formulating said boundaries. In AO special flood hazard
31 areas flooding is expected to be due to run off, as from heavy rains or the a storm-driven breach
32 of the ocean dune; in AE areas, from rising water levels in a body of water such as Rehoboth
33 Bay; in VE areas, from high-velocity storm-driven waves over and above the elevated water
34 levels in adjacent bodies of water.

35
36 Most perspectives to the adaptation to sea-level rise include several options: adaptation of zoning
37 regulations and building practices to accommodate rising sea levels and increased storm severity,
38 protection of properties and resources, and planned retreat in the face of rising sea level and the
39 subsequent inability to provide infrastructure services to certain properties. A Delaware
40 Statewide Adaptation Plan for Sea Level Rise is being developed under DNREC’s Delaware
41 Coastal Programs. The adaptation plan, when complete, will recommend policy changes and
42 practices that will ensure that Delaware makes informed policy and investment decisions today
43 to prevent damage and losses to infrastructure, resources and homes tomorrow.

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45 **6.4.2 Critical Issues and Plan Objectives and Recommendations**

46 *Rising Sea Levels*

1 Data collected and analyzed by the DNREC Sea Level Rise Technical Group (see Preparing for
2 Tomorrow's High Tide; Sea Level Rise Vulnerability Assessment for the State of Delaware,
3 2012) for the show an average rate of relative sea level rise in Lewes, DE over the past 100-plus
4 years of 3.2 millimeters per year. Analysis of the data over the most recent 30 years gave a rate
5 of increase approximately twice that. This is the result both of an increase in global ocean levels
6 and land subsidence in Coastal Delaware. In its report the Technical Workgroup chose to
7 recommend a range of three scenarios to DNREC because it is not possible to precisely predict
8 future rates of sea level rise. The three scenarios can be used as a planning tool to determine a
9 range of potential outcomes and options. The Technical Workgroup's low scenario was a sea
10 level rise of 0.5 meters (1.6 feet) between now and the year 2100. This scenario is slightly higher
11 than the current rate of sea level rise in Delaware and is partially based on low estimates for
12 future global warming. The high scenario was a sea level rise of 1.5 meters (4.9 feet) between
13 now and the year 2100. This scenario is based on higher estimates of future global warming. The
14 intermediate scenario was 1.0 meter (3.3 feet) between now and the year 2100, and is based on
15 moderate estimates of future global warming. In each scenario the rates of sea level rise increase
16 with time, consistent with expectations of most climate scientists.

17
18 Since this report, the effects of melting and loss of the Antarctica ice cap – which were omitted
19 in prior sea level rise calculations – have recently been determined to possibly add another 3 feet
20 of sea level rise this century – making the Technical Group's worst case scenario possibly the
21 most likely scenario. From a best-case perspective the Town is facing about a one foot increase
22 in effective sea level rise over the next 50 years; worst case, likely a two and a quarter foot rise.
23 The worst case scenario places a 3 foot SLR at around 2080, a mere 65 years in the future.

24
25 A good tool to envision the impact of various levels of sea level rise and the resulting coastal
26 flooding is provided by the National Oceanographic and Atmospheric Agency (NOAA) and can
27 be found at <https://coast.noaa.gov/slr>. Reproductions of maps for Dewey Beach under scenarios
28 of 1 foot, 2 feet, and 3 feet of sea level rise(SLR) are reproduced in Map ____.

29
30 At 1 foot SLR there doesn't appear to be much change from the flooding situation experienced
31 today; at 2 feet SLR, about half of the properties between Dagsworthy and Rodney (those closest
32 to the Bay) and most of the marshland south of Town are underwater at normal high tides; at 3
33 feet SLR, almost all of the land area abutting Rehoboth Bay west of Coastal Highway is under
34 water at high tide; at 4 feet SLR flooding at high tide crosses Coastal Highway and extends
35 northward along Bayard Ave. past Swedes St.; at 6 feet SLR all of Coastal Highway south of
36 Swedes is under water at high tide and much of the beach blocks in the south part of Town as
37 well.

38
39 To emphasize how this is not a local Dewey Beach problem, at 3 feet SLR most of Coastal
40 Highway from the south end of Dewey Beach to the Indian River Inlet is under water at high
41 tide. Coastal Highway is an emergency evacuation route, and in the face of modest sea level rise
42 and increasingly severe storms it will be a challenge to the State and DELDOT to keep Coastal
43 Highway available for use for emergency evacuation and emergency responders. And, while
44 Rehoboth Beach will not be significantly affected by a 3 foot SLR, the western portions of

1 Bethany Beach, South Bethany, and Fenwick Island would be devastated in manners similar to
2 that for Dewey Beach.

3 These maps only show the results of sea level rise in a “bath tub” model. One also has to
4 consider the effects of spring tides which often are a foot or more higher than mean high tide,
5 and of storm driven waters. During Super Storm Sandy the storm surge at high tide was 6 or 7
6 feet. Two feet of SLR and another Sandy would result in most of the southern half of Dewey
7 Beach being under water.

8 The Technical Groups worst case scenario (perhaps a most likely scenario when correcting for
9 lost Antarctica ice mass) a local sea level rise of 1 foot might occur as soon as 2035; 2 feet of
10 SLR, by 2060; and 3 feet of SLR, by 2080. While 65 years (worst case scenario estimate
11 regarding a 3 foot increase in SLR) seems a long way off, the projected period between a 2 foot
12 increase which the Town should be able to adapt to, and a 3 foot increase which could be
13 catastrophic without a major effort toward protection might be a mere 20 years. Because any
14 solution to preserve the continued viability of Dewey Beach will be extraordinarily expensive
15 and take time to effectuate, the time is soon coming upon us to start planning and saving.
16

17 ***Obj. SLR - 1 The Town’s strategic response to climate change preserves its culture***
18 ***and commerce over the next 50 years.***

19 High-priority recommendations to protect property values, to protect against increased
20 flooding due to global climate change, and to continue to provide for the health safety
21 and welfare of the population include:

- 22 • The Town should establish a standing committee to monitor State and national
23 policy and trends in adaptation to sea-level rise, and to monitor rates of local sea
24 level rise and direct impacts to Dewey Beach;
 - 25 • The Town should form alliances with all cognizant Federal, State, and local
26 entities, including FEMA, DEMA, Army Corps of Engineers, DelDOT, and the
27 towns of Coastal Delaware threatened by sea level rise to strategically address a
28 unified answer to SLR that will ensure the continued utility of Coastal Highway
29 as an emergency evacuation route and the continued viability of Delaware’s
30 coastal communities;
 - 31 • The Town should work to establish a strategy now, that is consistent with
32 evolving State guidelines and which it will implement for adaption to sea level
33 rise when the local sea level has risen by an incremental 2.0 feet from its 2017
34 level, and take steps to ensure suitable resources – including funds for Dewey
35 Beach’s cost share and/or loan repayment – are available for planning and
36 implementation;
 - 37 • The Town should partner with Center for the Inland Bays and other cognizant
38 Federal and State agencies to design, engineer, and implement solutions to protect
39 the Rehoboth Bay shoreline from storm driven surges.
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